

WHAT IS CLAIMED IS:

1. A method for providing a distributed service in a network, comprising:

executing a distributed service on a first virtual  
5 machine at a first router located on a first network;  
receiving lease constraints associated with a  
request to use the distributed service; and  
determining to move the distributed service to a  
second virtual machine at a second router based on the  
10 lease constraints.

2. The method of Claim 1, further comprising:  
locating the second virtual machine at the second  
router;

15 allocating a processing resource on the second  
virtual machine to execute the distributed service; and  
moving the distributed service from the first  
virtual machine to the second virtual machine.

20 3. The method of Claim 1, wherein determining to  
move the distributed service by the first virtual machine  
based on the lease constraints comprises:

analyzing traffic flow on the first network; and  
moving the distributed service to the second virtual  
25 machine on the second router to optimize the traffic flow  
on the first network.

4. The method of Claim 1, wherein:

the lease constraints comprise a minimum amount of processing resources required to execute the distributed service; and

5 determining to move the distributed service by the first virtual machine based on the lease constraints comprises:

identifying processing resources available to execute the distributed service on the first virtual  
10 machine; and

moving the distributed service to the second virtual machine on the second router if the minimum amount of processing resources is greater than the identified processing resources.

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5. The method of Claim 1, wherein:

the lease constraints comprise a required portion of the distributed service requested for use; and

determining to move the distributed service by the  
20 first virtual machine based on the lease constraints comprises:

measuring an available portion of the distributed service on the first virtual machine; and  
moving the distributed service to the second  
25 virtual machine on the second router if the required portion is greater than the available portion.

6. The method of Claim 1, further comprising moving a portion of the distributed service to the second virtual machine at the second router based on the lease constraints.

7. The method of Claim 1, further comprising: locating a service broker on the first network; and requesting that the service broker locate the distributed service.

8. The method of Claim 1, further comprising: locating a service broker on the first network; requesting that the service broker locate the distributed service; identifying a plurality of locations for the distributed service on one or more networks; and determining availability of the distributed service at each identified location.

9. The method of Claim 1, further comprising: locating a service broker on the first network; asking the service broker to create a service path including a plurality of distributed services that perform a desired function; determining a plurality of locations of each of the distributed services on one or more networks; selecting the distributed services based on the lease constraints; and combining the selected distributed services to perform the desired function.

10. A method for providing a distributed service in a network, comprising:

executing a distributed service on a first virtual machine at a first router located on a first network;

5 receiving lease constraints associated with a request to use the distributed service, the lease constraints including a required portion of the distributed service requested for use;

measuring an available portion of the distributed service on the first virtual machine; and

10 moving the distributed service to a second virtual machine on a second router if the required portion is greater than the available portion.

15 11. The method of Claim 10, further comprising:

copying the distributed service to create a duplicate distributed service;

moving the duplicate distributed service to the second virtual machine at the second router; and

20 removing the distributed service from the first virtual machine when the lease constraints expire.

12. The method of Claim 10, further comprising:  
locating a service broker on the first network;  
requesting that the service broker create a service  
path including a plurality of distributed services that  
5 perform a desired function;

determining a plurality of locations of each of the  
distributed services on one or more networks;

selecting the distributed services based on the  
lease constraints; and

10 combining the selected distributed services to  
perform the desired function.

13. The method of Claim 10, further comprising:  
locating a service broker on the first network;  
15 requesting that the service broker locate the  
distributed service; and

generating the lease constraints associated with the  
request to use the distributed service.

14. A router, comprising:  
a processor; and  
a first virtual machine coupled to the processor,  
the virtual machine operable to:  
5 host a distributed service;  
receive lease constraints associated with a  
request to use the distributed service; and  
determine if the distributed service should be  
moved to a second virtual machine on a remote router  
10 based on the lease constraints.

15. The router of Claim 14, wherein the first  
virtual machine is operable to:  
locate the second virtual machine on the remote  
15 router;  
allocate a processing resource on the remote router  
to execute the distributed service on the second virtual  
machine; and  
move the distributed service from the first virtual  
20 machine to the second virtual machine.

16. The router of Claim 14, wherein:  
the lease constraints include a minimum amount of  
processing resources required to execute the distributed  
25 service; and  
the first virtual machine is operable to:  
identify a portion of the processor available  
to execute the distributed service on the first virtual  
machine; and  
30 move the distributed service to the second  
virtual machine on the remote router if the minimum  
amount of processing resources is greater than the  
identified portion of the processor.

17. The router of Claim 14, wherein:  
the lease constraints include a portion of the  
distributed service requested for use; and  
the first virtual machine is operable to:  
5 measure an available portion of the distributed  
service; and  
move the distributed service to the second  
virtual machine on the remote router if the required  
portion is greater than the available portion.

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18. The router of Claim 14, wherein the first  
virtual machine is operable to:  
analyze traffic flow on a first network; and  
move the distributed service to the second virtual  
15 machine on the remote router to optimize the traffic flow  
on the first network.

19. The router of Claim 14, wherein the first  
virtual machine is operable to:  
20 copy the distributed service to create a duplicate  
distributed service;  
move the duplicate distributed service to the second  
virtual machine on the remote router; and  
remove the distributed service when the lease  
25 constraints expire.

20. Logic encoded in media for providing a distributed service at a router within a network, the logic operable to perform the following steps:

executing a distributed service on a first virtual  
5 machine at a first router located on a first network;  
receiving lease constraints associated with a request to use the distributed service; and  
determining to move the distributed service to a second virtual machine at a second router based on the  
10 lease constraints.

21. The logic of Claim 20, further comprising:  
locating the second virtual machine at the second  
router;

15 allocating a processing resource on the second virtual machine to execute the distributed service; and  
moving the distributed service from the first virtual machine to the second virtual machine.

22. The logic of Claim 20, wherein:  
the lease constraints comprise a required portion of the distributed service requested for use; and  
determining to move the distributed service by the first virtual machine based on the lease constraints  
25 comprises:

measuring an available portion of the distributed service on the first virtual machine; and  
moving the distributed service to the second virtual machine on the second router if the required  
30 portion is greater than the available portion.



23. The logic of Claim 20, wherein determining to move the distributed service by the first virtual machine based on the lease constraints comprises:

- analyzing traffic flow on the first network; and
- 5 moving the distributed service to the second virtual machine on the second router to optimize the traffic flow on the first network.

24. The logic of Claim 20, further comprising:  
10 copying the distributed service to create a duplicate distributed service;

- moving the duplicate distributed service to the second virtual machine at the second router; and
- removing the distributed service from the first
- 15 virtual machine if the lease constraints expire.

25. The logic of Claim 20, further comprising moving a portion of the distributed service to the second virtual machine at the second router based on the lease  
20 constraints.

26. The logic of Claim 20, further comprising:  
locating a service broker on the first network;  
requesting that the service broker locate the  
25 distributed service;

- identifying a plurality of locations of the distributed service on one or more networks; and
- determining availability of the distributed service at each identified location.

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27. The logic of Claim 20, further comprising:  
locating a service broker on the first network;  
asking the service broker to create a service path  
including a plurality of distributed services that  
5 perform a desired function;  
determining a plurality of locations of each of the  
distributed services on one or more networks;  
selecting the distributed services based on the  
lease constraints; and  
10 combining the selected distributed services to  
perform the desired function.

28. An apparatus for providing a distributed service at a router within a network, comprising:

means for executing a distributed service on a first virtual machine at a first router located on a first

5 network;

means for receiving lease constraints associated with a request to use the distributed service; and

means for determining to move the distributed service to a second virtual machine at a second router  
10 based on the lease constraints.

29. The apparatus of Claim 28, wherein:

the lease constraints comprise a required portion of the distributed service requested for use; and

15 determining to move the distributed service by the first virtual machine based on the lease constraints comprises:

means for measuring an available portion of the distributed service on the first virtual machine; and

20 means for moving the distributed service to the second virtual machine on the second router if the required portion is greater than the available portion.

30. The apparatus of Claim 28, further comprising  
25 means for moving a portion of the distributed service to the second virtual machine at the second router based on the lease constraints.